Listing of Claims:

This listing of claims replaces all prior versions and listings of claims in the application.

1. (Currently Amended) An n-type semiconductor diamond, characterized by a ~~crystalline perfectness whereby~~ making method comprised of:

~~it has impurity atoms constituted by sulfur atoms forming a single donor level of 0.38 eV,~~

~~it has a carrier mobility's temperature dependency which at a temperature (T) range in excess of the room temperature is T-3/2 dependent, and~~

~~it has a diamond peak in its Raman spectrum, whose half width is 2.6 cm-1;~~

~~a crystalline perfectness whereby:~~

~~light emission by excitons is observable; and~~

~~a crystalline perfectness whereby:~~

~~a distinct Kikuchi pattern in its reflection electron diffraction analysis is observable~~

mechanically polishing a (100) diamond surface to make it in an inclined diamond substrate;

subjecting a surface of said inclined diamond substrate to a hydrogen plasma to make said substrate surface to consist of steps each in the order of an atomic layer; and

subjecting said substrate surface consisted of steps each in the order of an atomic layer to an exited raw material gas made of a volatile hydrocarbon compound, a sulfur compound and a hydrogen gas by a microwave plasma to cause n-type semiconductor diamond to grow epitaxially on said surface consisted of steps each in the order of an atomic layer,

wherein said n-type semiconductor has a single donor level of 0.38 eV, which is sufficient to allow operation of said n-type semiconductor diamond as p-n junction device.

2. (Canceled)

3. (Previously Presented) A method of making an n-type semiconductor diamond, characterized in that it comprises:

mechanically polishing a diamond substrate to make it in an inclined diamond substrate, which is formed by mechanically polishing a diamond (100) face oriented substrate so that its face normal is inclined at an angle between 1.5 and 6 degrees with respect to its <100> direction in a plane made by either its <100> and <010> directions or its <100> and <001> directions;

subjecting a surface of said inclined diamond substrate to a smoothening treatment make it even; and

exciting a raw material gas made of a volatile hydrocarbon compound, a sulfur compound and a hydrogen gas by a microwave plasma while maintaining at a given temperature said substrate surface smoothened as aforesaid to cause n-type semiconductor diamond to grow epitaxially on said smoothened substrate.

4. (Previously presented) A method of making an n-type semiconductor diamond as set forth in claim 3, characterized in that said diamond substrate is a diamond (100) face oriented substrate.

5. (Canceled)

6. (Previously Presented) A method of making an n-type semiconductor diamond as set forth in claim 3, characterized in that said smoothening treatment comprises a treatment of exposing said inclined substrate to the hydrogen plasma of a hydrogen pressure of 10 to 50 Torr and a microwave output of 200 to 1200 W at a substrate temperature of 700 to 1200 °C for a period of 0.5 hours to 5 hours, thereby to make even said substrate surface to consist of steps each in the order of an atomic layer.

7. (Previously Presented) A method of making an n-type semiconductor diamond as set forth in claim 3, characterized in that said given substrate temperature is between 700 and 1100 °C.

8-19. (Canceled)

20. (Previously Presented) A method of making an n-type semiconductor diamond as set forth in claim 7, characterized in that said given substrate temperature is 830°C.